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AUTHOR DiNapoli, Nicholas Paul; And Others
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ABSTRACT

The Boehm Test of Basic Concepts (BTBC) (Boehm, 1971) was administered to 99 children (ages 7-10) who had been diagnosed as learning disabled and attended special schools in the New York area. It was hypothesized that the learning disabled children would exhibit a delay in the acquisition of the basic concepts, but would display a similar order of acquisition of the concepts as compared to the normative sample of the BTBC. The results indicated that the 7- to 9-year-old learning disabled (LD) children scored significantly lower than the normative sample of 7-year-old children. Kendall Correlations computed between the normative sample and the LD children indicated that the rank-order of difficulty of basic concept acquisition was similar in the two groups. Results supported the hypothesis that learning disabled children acquire basic concepts at a later age than normal. Subjects acquired concepts in the same order as the normative population. (Author/CL)

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Basic Concept Acquisition in Learning Disabled Children

Nicholas Paul DiNapoli, Steven Kagedan-Kage,
and Ann E. Boehm
Teachers College, Columbia University

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Abstract

The Boehm Test of Basic Concepts (BTBC) (Boehm, 1971) was administered to 99 children, ages seven to ten, who have been diagnosed as learning disabled and attend special schools in the New York area. It was hypothesized that the learning disabled children would exhibit a delay in the acquisition of the basic concepts, but would display a similar order of acquisition of the concepts as compared to the normative sample of the BTBC. The results indicate that the seven- to nine-year-old learning disabled children scored significantly lower than the normative sample of seven-year-old children. Kendall Correlations computed between the normative sample and the LD children indicate that the rank-order of difficulty of basic concept acquisition was similar in the two groups.

Basic Concept Acquisition in Learning Disabled Children

The Boehm Test of Basic Concepts (BTBC) (Boehm, 1971) is a diagnostic measure of a child's mastery of fifty relational concepts. The concepts such as above, separated, least, and left are classified on four dimensions of space, quantity, time, and miscellaneous. Their importance for children in the primary grades has been well established in several recent studies. Boehm, Kaplan, and Preddy (1979) found that the basic concepts appeared at a rate of 3.24 concepts per page in reading curricula, and in 34.7% of teacher directions. Kaufman (1978) found between two and fourteen basic concepts in the directions of the Wechsler Preschool and Primary Scale of Intelligence, the Illinois Test of Psycholinguistic Abilites, the Stanford-Binet, and McCarthy Scales. Supplementary support for the importance of the concepts is provided by a number of studies which have found a correlation between BTBC scores and academic achievement (Ernhart, Spaner, & Jordan, 1977; Estes, Harris, Moers, & Wodrich, 1976; Stienbauer & Heller, 1978).

Based upon a review of studies on language acquisition in learning disabled and other handicapped youngsters (Chin, 1974; Caton, 1975; Wiig & Semel, 1973) two hypothesis concerning acquisition of basic concepts in learning disabled children were raised: First, learning disabled children will exhibit a delay in the acquisition of basic concepts when compared to the normative

data; Second, learning disabled children will acquire basic concepts in the same relative order as the normative sample.

Method

Subjects. Ninety-nine children, 77 males and 22 females, ages seven to ten, attending five private schools for LD in New York City participated. All subjects were diagnosed as learning disabled by independent agencies. IQ scores were available on 80 subjects. The mean IQ was 91 ranging from 60-127. Table 1 presents a breakdown of

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Insert Table 1 about here

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the subjects IQ scores by age.

Procedure. The Boehm Test of Basic Concepts, Form A, (Boehm, 1971) was administered to all the subjects in groups of one to three students. The test consists of 50 picture displays which represent basic relational concepts such as same, different, always, divided into four categories of space, time, quantity, and miscellaneous. The child is required to point to the correct drawing out of three choices, in response to the examiners' instructions.

Results

Table 2 shows the means and standard deviations for the

Insert Table 2 about here

learning disabled children on the BTBC and the normative data. The means are 42, 42, 43, and 45 for the seven-, eight-, nine-, and ten-year-olds, respectively. T-tests indicate that the mean scores of the seven-year-olds ($t(14) = 2.98$, $p < .01$), eight-year-olds ($t(31) = 2.457$, $p < .01$), and nine-year-olds ($t(40) = 2.423$, $p < .01$) are significantly lower than the mean score of the normal seven-year-olds. However, there is no statistical difference between the means of the ten-year-old subjects and those of the normal seven-year-olds. Notice the large standard deviations in the test scores of the LD population in comparison to the 2.9 standard deviation in the scores of the normative population. This indicates that there is a greater variability among the individual test scores of the LD children.

Based on the rank-order of difficulty of individual concept acquisition, Kendall Correlations were computed between the norms and the LD children (see Table 3). The

Insert Table 3 about here

results show moderately high correlations at each age level which are significant ($p < .001$). Therefore, the LD children

acquire basic concepts in the same relative order as normal children.

Table 4 lists the concepts most difficult for the LD

Insert Table 4 about here

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subjects relative to the normative data. The difference in the percent of children passing each item between the LD children's data and the normative data was calculated for each LD age group. For example, the table indicates that 10-15% fewer seven-year-old LD children passed the concept over as compared to the normative sample. Some of the most difficult concepts for the subjects are: always, equal, side, alike, and left.

Discussion

The results support the hypothesis that learning disabled children acquire basic concepts at a later age than normal. It is only by age ten that they reach the same proficiency on basic concepts, which is reached by age seven in the normative population. Wiig and Semel (1976), in their review of language research among learning disabled children, suggested that adjectives and prepositions that designate time, quantity, space, and location which include many of the basic concepts, may present special difficulties for this population. Although the LD children acquire the concepts at a later age, the

results show acquisition of individual concepts in the same order as the normative population. This is similar to Chin (1974) and Caton (1975) who found that mentally retarded and deaf children acquire concepts in the same order as the normal population.

Assessment of basic concepts is useful only if remediation of the concepts is possible. Moers and Harris (1978) instructed first graders twice a week, 230 minutes a session of 15 weeks following Boehm's (1971) instructional program. Although there was no significant improvement from pretest to posttest scores on the BTBC there was an increase on the Stanford Achievement Test. This indicates specific instruction facilitates overall school achievement. Levin, Henderson, Levin, and Hoffer (1975), indicate that head-start children show significant increases in their knowledge of basic concepts when given tutoring on them.

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Footnotes

[1]The authors wish to express their appreciation to the students, teachers, and administratiors of the Gateway, Churchill, Lowell, Kaliski, and Horizon Schools.

Table 1

Mean IQ Test Scores of Subjects by Age

Age	N	Mean I Q	Range
7	12	92	74-119
8	24	91	72-127
9	35	91	60-121
10	9	86	71-106

Table 2

Means and Standard Deviations of Seven,- Eight,- Nine,- and Ten-Year-Old Learning-Disabled Children and Seven-Year-Old Normative Sample on the BTBC

Age	n	Mean	Standard Deviation
7	15	42*	6.54
8	32	42*	7.46
9	41	43*	6.05
10	11	45	4.2
Normative 7-Yr.-Olds Middle SES	381	47	2.9

*$p < .01$

Table 3

Kendall Correlation Coefficients for Relative Order of Concept Attainment Between Normative Data and Learning-Disabled Students

Age	N	Correlation
7	15	.54*
8	32	.53*
9	41	.59*
10	11	.70*

* $p < .001$

Note. Based on rank-ordering of individual concepts by age

Table 4

Concepts Appearing Most Difficult for LD Students Relative to the Norms

Percent Difference[a]	Ages			
	7	8	9	10
10-15	over	between	center	right
	several	second	alike	several
	some, not many	center	not first or last	skip
	most	side	never	
	different	other	right	
	right	forward	forward	
	every	above	above	
		left		
		pair		
		in order		
		third		
16-20	row	widest	after	
	side	almost	beginning	
	alike	as many	other	
	never	least	between	
	below		left	
	least		skip	
21-25	as many	several	side	side
	separated	not first or last	always	
	skip		pair	

(Table 4 continued)

	Ages			
	7	8	9	10
26-30	half beginning	equal beginning	equal several	
31-35	other not first or last left equal in order			always
36-40	between always			equal
//				
61-65		alike		

[a]Percent difference was computed by subtracting the percent of LD children at each age passing each concept from the normative data for middle of the year seven-year-olds, middle SES.